

## Engineering Design File

PROJECT NO. 23052

# OU 3-13, Group 7, VES-SFE-20 Hot Waste Tank System Remediation Underground Utilities Study



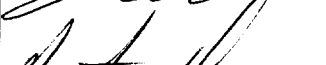
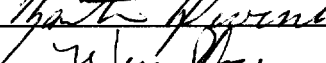

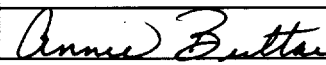
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Idaho Falls, Idaho



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Rev. 04

# ENGINEERING DESIGN FILE

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OU 3-13, Group 7, VES-SFE-20 Hot Waste Tank System Remediation				
1. Title: <u>Underground Utilities Study</u>		Page 1 of 1		
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5. Summary: The purpose of this Engineering Design File is to document the underground piping that will be affected by Phase I, Phase II, or both phases of the hot waste tank system remediation project. A large amount of soil will be excavated to remove the underground vault and vessel SFE-20. This Engineering Design File is a drawing review to identify the existing elevations of the underground pipes in the area of excavation.				
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Performer/Author	N/A	R. M. VanVoast/67A0		6/19/03
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## CONTENTS

1.	INTRODUCTION.....	3
2.	PURPOSE.....	3
3.	VES-SFE-20 TANK SYSTEM DESCRIPTION .....	3
4.	DISCUSSION OF THE REMEDIATION ACTION .....	3
5.	CONCLUSION .....	5
6.	REFERENCES.....	6
	Appendix A—Table A-1, Underground Piping Projected Elevations .....	7
	Appendix B—Drawing U-1, Underground Utilities Plan.....	11

## FIGURES

1.	Location of the VES-SFE-20 tank in WAG 3 .....	4
2.	Isometric view of the tank vault and pump pit.....	5

# **OU 3-13, Group 7, VES-SFE-20 Hot Waste Tank System Remediation Underground Utilities Study**

## **1. INTRODUCTION**

The Operable Unit (OU) 3-13 remedial investigation and feasibility study process evaluated the nature and extent of soil and groundwater contamination at the Idaho Nuclear Technology and Engineering Center (INTEC); this included the investigation and remediation approach for Group 7. As documented in the OU 3-13 Record of Decision (ROD) (DOE-ID 1999), the selected remedial approach for Group 7 is to remove the tank and its contents; the vault; the remainder of the SFE-20 structures, piping, and other components; and any potentially contaminated soils and transport them for either on-Site or off-Site disposal.

## **2. PURPOSE**

The purpose of this Engineering Design File (EDF) is to document the underground piping that will be affected by Phase I, Phase II, or both phases of the hot waste tank system remediation project. A large amount of soil will be excavated to remove the underground vault and Vessel-Storage Exterior Facility (VES-SFE)-20. This EDF is a drawing review to identify the existing elevations of the underground pipes in the area of excavation.

## **3. VES-SFE-20 TANK SYSTEM DESCRIPTION**

The SFE-20 Hot Waste Tank System is also known as Site CPP-69, which consists of a concrete vault containing an abandoned radioactive liquid waste storage tank. The top of the tank vault is located about 3 m (10 ft) below grade. The tank system consists of the tank contents, tank, and associated structures located east of Building CPP-603 (Figure 1). The VES-SFE-20 system includes the VES-SFE-20 tank, tank vault, access tunnel, associated pump pit, and Building CPP-642 with related piping and instrumentation (Figure 2). Based on historical information, the lines that fed the VES-SFE-20 tank and transferred the waste to the PEW were isolated from this tank and incorporated into other tank systems when the use of the VES-SFE-20 tank was discontinued in 1976. What remains of the tank system will be removed as part of the remedial action described in the OU 3-13 ROD.

## **4. DISCUSSION OF THE REMEDIATION ACTION**

The remedial design for the VES-SFE-20 Hot Waste Tank will reflect the ROD requirement that the tank system, including contaminated surrounding soils, be removed, treated, and disposed of in an approved disposal facility. The excavation and remediation of the VES-SFE-20 Tank System, plus any contaminated underlying soils, are complicated in that active structures and utilities exist near the excavation site. In addition, the tank is located 20 ft below grade with the vault floor extending deeper. An active concrete pipe corridor supporting operation of VES-SFE-106 was constructed over a portion of the VES-SFE-20 vault and doweled into the foundation of CPP-642, further complicating removal. As a result, the approach for the remediation of the VES-SFE-20 tank system will consist of two phases. During Phase I, the tank vault will be accessed and the tank and necessary piping within the vault will be removed. Next, a temporary concrete roof will be placed on the vault opening and the area backfilled. Phase II will consist of removing the concrete structures including the vault, tunnel, and pump pit, as well as the remaining piping, Building CPP-642, and any contaminated adjacent and underlying soils. Phase II will occur following the closure of SFE-VES-106 and CPP-648 such that the pipe corridor overlying the VES-SFE-20 tank vault can be removed.

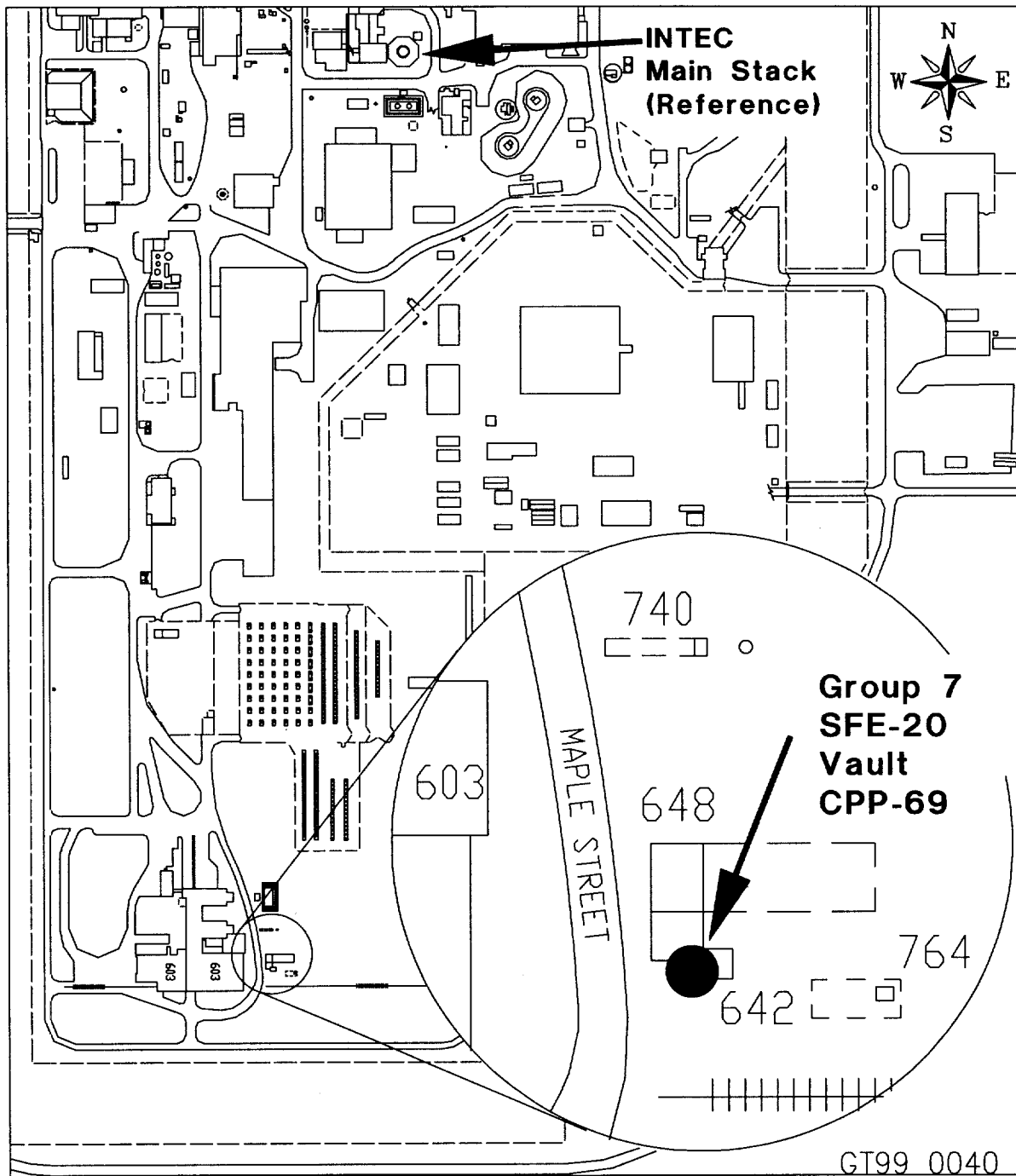
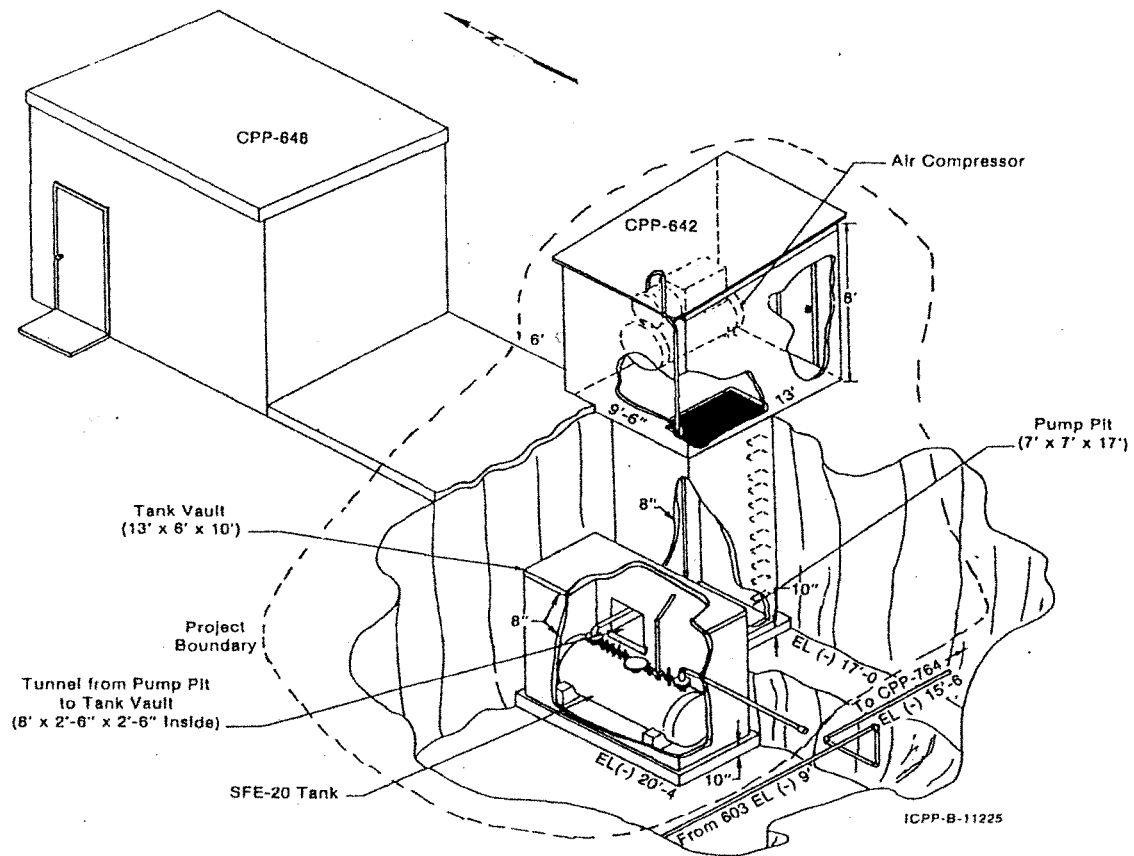


Figure 1. Location of the VES-SFE-20 tank in WAG 3.



Isometric view of tank vault and pump pit.

Figure 2. Isometric view of the tank vault and pump pit.

Phase I excavation will consist of a sloped excavation to expose the roof of the vault. The final excavation will have a 2-ft wide horizontal surface adjacent to the concrete roof approximately 1 ft below the top surface of the vault. This will create a working surface along three sides of the vault. From the outer perimeter of the working surface, the excavation will slope up to original grade at 1.5H:1V.

Phase II excavation will consist of a shored excavation that is assumed to extend to basalt. Shoring is required due to the numerous existing structures in the area and the overall depth of the excavation. An excavation boundary was selected such that shoring operations must be contained within.

Inactive underground pipes uncovered during excavation in Phase I and II will be demolished. The piping will be cut and capped at this point and the portion of the pipe that is not hindering excavation will be left inactive and abandoned in place. Active underground pipes will be rerouted in Phase I around the Phase II excavation outline to eliminate any additional rerouting in Phase II.

## 5. CONCLUSION

The design package will address the rerouting, demolishing, or cutting and capping of each line based on each pipelines elevation and the depth and area of the excavation area.

The pipes and the corresponding elevations are shown in the Excel spreadsheet in Appendix A and on the underground utilities drawing in Appendix B.

## 6. REFERENCES

DOE-ID, 1999, *Final Record of Decision, Idaho Nuclear Technology and Engineering Center, Operable Unit 3-13*, DOE-ID 10660, Rev. 0, U.S. Department of Energy Idaho Operations Office, October 1999.

## **Appendix A**

### **Table A-1, Underground Piping Projected Elevations**



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Table A-1. Underground piping projected elevations.

Pipeline	Label on Drawing U-1	Elevation		Drawing Reference Source:	Service	Status as of 11/02	Construction Phase Affected
1 1/2 in. HSN	1	4910.79*	Bottom of pipe	105946 (834-CPP-603-P1)	High pressure steam	Abandoned	Phase I and II
		4913.8*	Bottom of pipe	55345			
1 in. CTN	2	4910.64	Bottom of pipe	105951 (834-CPP-603-P6)	Condensate	Abandoned	Phase I and II
		4914.9#	Bottom of pipe	105951, 105946			
2 in. AIR	3	4913.3#	Bottom of pipe	55345	Air	Abandoned	Phase I and II
		4914.9#	Bottom of pipe	105946			
3/4 in. FWN	4	4913.9#	Bottom of pipe	55345	Fire water	Abandoned	Phase I and II
		4912.45*	Bottom of pipe	105946			
3/4 in. Drain	5	4910.7*	Bottom of pipe	55345	Drain	Abandoned	Phase I
		4912.45	Bottom of pipe	105946			
1 1/4 in. PLA-776	6	4909	Bottom of pipe	105946	Process waste	Abandoned, RCRA closure line%	Phase II
		4912*	Bottom of pipe	55345			
2 in. PLA-104801	7	4909.2*	Bottom of pipe	105946	Process waste	Abandoned	Phase I and II
		4903.3	Bottom of pipe	105946, 105951			
3/4 in. HAA-104797	8	4904.25	Bottom of pipe	105946	Process waste	Abandoned	Phase II
		4912.38+/-	Bottom of pipe	138063 (1578-CPP-603-P2)			
3/4 in. HSA-104757	9	4902.48+/-	Center of pipe	138063	Process waste	Abandoned	Phase I
		4903	Bottom of pipe	138063			
2 in. NAA-104791	10	4912	Bottom of pipe	138063	High pressure air	ACTIVE	Phase I and II
		4911	Bottom of pipe	138063			
4 in. PLA-100116	11	4903+/-	Bottom of pipe	138063	High pressure steam	Abandoned	Phase I and II
		4903.3	Bottom of pipe	138063			
	12	4903.3	Bottom of pipe	55345	Nitric acid	Abandoned	Phase I and II
		4901.8	Center of pipe	138063			
	13	4903.3	Bottom of pipe	55345	Process waste	ACTIVE	—
		4901.8	Center of pipe	138063			
	14	4903.3	Bottom of pipe	55345	Process waste	ACTIVE	—
		4901.8	Center of pipe	138063			
	15	4903.3	Bottom of pipe	55345	Process waste	ACTIVE	—
		4901.8	Center of pipe	138063			
	16	4903.3	Bottom of pipe	55345	Process waste	ACTIVE	—
		4901.8	Center of pipe	138063			
	17	4903.3	Bottom of pipe	55345	Process waste	ACTIVE	—
		4901.8	Center of pipe	138063			
	18	4903.3	Bottom of pipe	55345	Process waste	ACTIVE	—
		4901.8	Center of pipe	138063			
	19	4903.3	Bottom of pipe	55345	Process waste	ACTIVE	—
		4901.8	Center of pipe	138063			

## ENGINEERING DESIGN FILE

Table A-1. (continued).

Pipeline	Label on Drawing U-1	Elevation		Drawing Reference Source:	Service	Status as of 11/02	Construction Phase Affected
3 1/2 in. PLA-100115	20	4910.2	Bottom of pipe	55345	Process waste	ACTIVE	—
2 in. CTA-100114	21	4919.8	Bottom of pipe	55345	Condensate	Abandoned	—
	22	4914.2	Bottom of pipe	55345			—
2 in. PLA-100313	23	4912.6	Bottom of pipe	55345	Process waste	ACTIVE	—
1 in. PLA-100308		4912.6	Bottom of pipe	55345	Process waste	ACTIVE	—
2 in. spare		4912.6	Bottom of pipe	55345	Spare	—	—
2 in. HSN-100318	24	4912.87+/-	Bottom of pipe	127968 (1355-603/648 P-9)	High pressure steam	Abandoned	—
3/4 in. FWN-100435	25	4913.45+/-	Bottom of pipe	127968	Fire water	ACTIVE	—
3/4 in. CTA-100575	26	4913.45+/-	Bottom of pipe	127968	Condensate	ACTIVE	—
1 1/2 in. PLA-104804	27	4908.7	Center of pipe	127969 (1355-603/648 P-10)	Process waste	ACTIVE	Phase II
		4906.2	Center of pipe	127967 (1355-603/648 P-8)			
2 in. HAA-105541	28	Unknown	N/A	N/A	High pressure air	ACTIVE	Phase I and II

\* In all elevation discrepancy cases, the higher elevation was utilized in the design to be conservative.

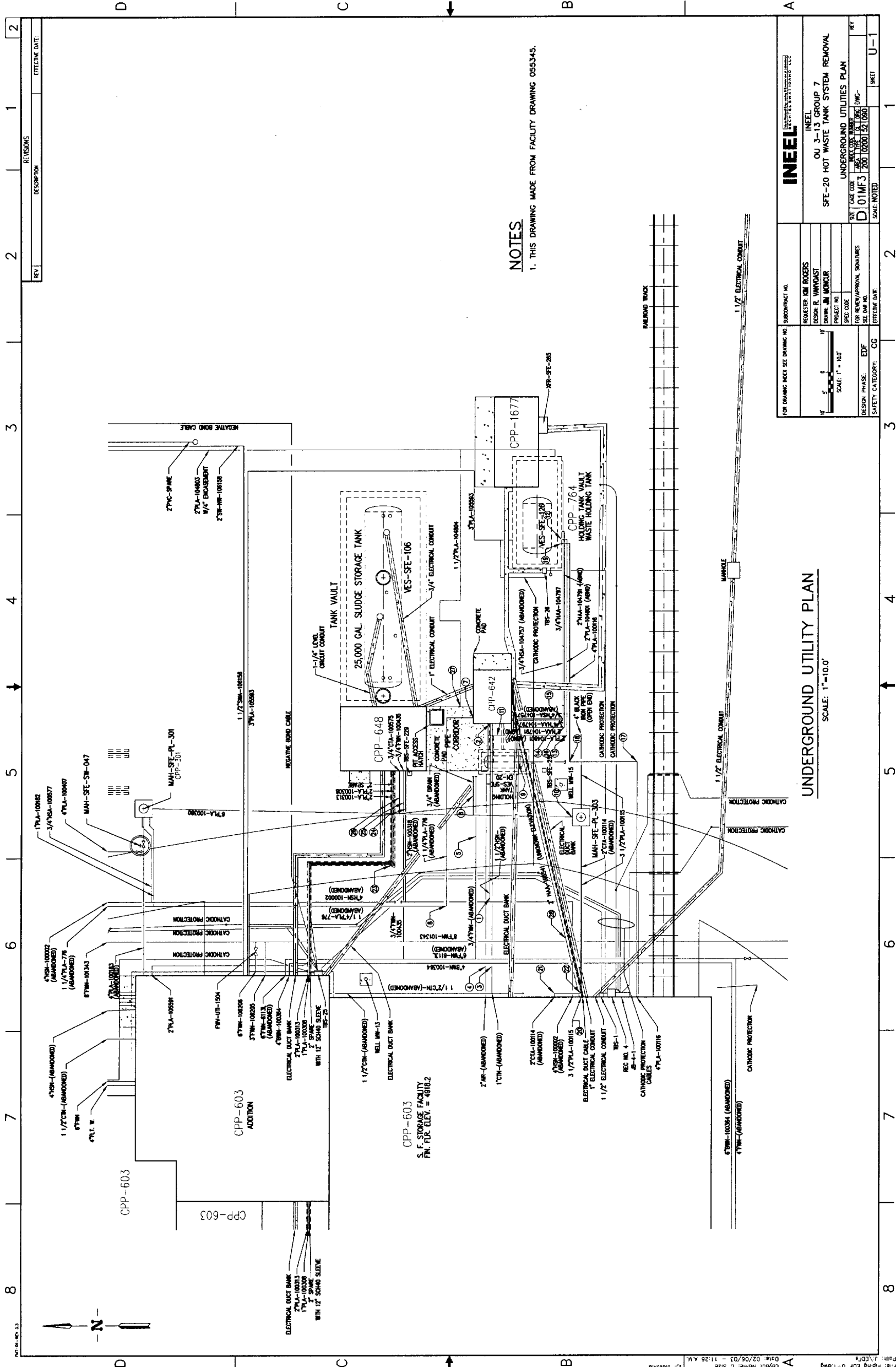
# The lower elevation was used in this instance because 055345 is a more recent accurate drawing.

- Not affected in SFE-20 remediation activity.

% In discussion with Susan Evans, this abandoned line is not currently identified on a RCRA closure plan but is expected to be closed after the completion of this project.

**Appendix B**  
**Drawing U-1, Underground Utilities Plan**

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FOR DRAWING INDEX SEE DRAWING NO. 0500000000		INEEL	
REQUESTER: KIM ROGERS		OU 3-13 GROUP 7	
DESIGNER: E. VANHOUST		SFE-20 HOT WASTE TANK SYSTEM REMOVAL	
DRAWN: JIM MANOLIS		UNDERGROUND UTILITIES PLAN	
PROJECT NO. 0000000000		SHEET NO. 0000000000	
SCALE: 1" = 10.0'		DATE: 01/30/2003	
DESIGN PHASE: EDF		SHEET NO. 0000000000	
SAFETY CATEGORY: CG		SHEET NO. 0000000000	

UNDERGROUND UTILITY PLAN	
SCALE: 1"=10.0'	